

## **Descartes' Contributions to Mechanics**

- **Global conservation principles as a constraint**
- **Curvilinear motion requires external action**
- **Measuring the magnitude of that action**
- **Force as a determiner of (quantity of) motion**
- **Impact and recoil as a fundamental process**
- **Relevance of fluid motion, esp. vortex motion**
- **The demand for universal first principles**

## Questions Highlighted

1. **What, if any, quantity is invariably conserved during every change in motion?**
2. **What is the magnitude of the external action required for curvilinear motion and with what does it vary?**
3. **Can mathematically precise rules be given for impact and recoil that agree with everyday observation?**
4. **What is the proper measure of quantity of motion, and with what does it vary?**
5. **What are the fundamental principles of mechanics – i.e. the principles that must be met in the solution of every problem in mechanics?**
6. **What is the magnitude of the “force” (*vis*) of bodies to resist changes in motion, and with what does it vary?**
7. **What is the relationship between the weight of a body, its specific gravity, and the quantity of matter forming it?**
8. **How can we determine, once and for all, whether vacuums – spaces free of all matter – are possible?**
9. **What is the physics of vortex motion, and do vortices have gradients in speed and pressure that Descartes says?**

## **Aims of Empirical Research**

- 1. To provide an account of the world around us that gives us a better understanding of it, at least to a reasonable degree of detail.**
- 2. To marshal empirical considerations toward establishing secure answers to those questions that (at the time) lend themselves to such answers.**
- 3. To provide means for improving our daily practical lives, especially through enabling us to achieve ends we otherwise could not achieve.**